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	Bioshares Portfolio
Year 1 (May '01 - May '02)	21.2%
Year 2 (May '02 - May '03)	-9.4%
Year 3 (May '03 - May '04)	70.6%
Year 4 (May '04 - May '05)	-16.3%
Year 5 (May '05 - May '06)	77.8%
Year 6 (May '06 - May '07)	17.4%
Year 7 (May '07 - May '08)	-36%
Year 8 (May '08 - May '09)	-7.4%
Year 9 (May '09 - May '10)	50.2%
Year 10 (May '10 - May '11)	45.4%
Year 11 (May '11 - May '12)	-18.0%
Year 12 (May '12 - May '13)	3.1%
Year 13 (May '13 - May '14)	26.6%
Year 14 (May '14 - May '15)	23.0%
Year 15 (May '15 - May '16)	33.0%
Year 16 (May '16 - May '17)	16.8%
Year 17 (May '17 - May '18)	-7.1%
Year 18 (May '18 - current)	-16.0%
Cumulative Gain	571%
Av. Annual gain (17 yrs)	17.1%

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Delivering independent investment research to investors on Australian biotech, pharma and healthcare companies

Extract from Bioshares –

Pharmaxis Tackles the Intractable

Pharmaxis (PXS: \$0.27) has moved its fourth internally designed compound into Phase I studies. Its pan LOX inhibitor is now being assessed in healthy volunteers with a trial in pancreatic cancer patients expected to start towards the end of the year.

LOX (lysyl oxidase) enzymes are involved in collagen cross linking, which leads to fibrosis developing in various organs.

Currently Pharmaxis is seeking to transact a deal for its LOXL2 inhibitors, with potential application for the treatment of NASH and idiopulmonary fibrosis.

However, with an application in cancer, particular highly stromal or fibrotic cancers such as pancreatic cancer, the company is taking a more aggressive approach by seeking to block all five LOX enzymes. (Stroma is structural or connective tissue.)

Pancreatic Cancer– Difficult to Treat

Pancreatic cancer is one of the most difficult cancers to treat. This is because of its highly fibrotic nature that prevents chemotherapy or other drugs entering the tumour. The fibrotic network also works as a passage for facilitating cancer metastases to leave the primary tumour and spread to other organs and other parts of the body.

The aim with Pharmaxis' pan LOX inhibitor is to inhibit the growth of the fibrotic network around the tumour.

In previous clinical studies by other groups, inhibiting just one of the LOX enzymes has shown to produce a clinically meaningful result when given in conjunction with chemotherapy.

In animal models, Pharmaxis' lead compound has been shown to reduce fibrosis in the kidneys, lungs, bone marrow and the pancreas.

One of the challenges in this patient population with pancreatic cancer is the very low life expectancy and rapid progression of disease. Only 20% of people are alive after one year following diagnosis of the disease.

Selecting 'clever' endpoints to gauge efficacy in a rapidly deteriorating patient population will be an aspect the company will be dealing with, according to Pharmaxis CEO Gary Phillips.

One of those measures may be assessing any increased perfusion into the tumour of blood flow (and thereby chemotherapy) as a result of treatment with a pan LOX inhibitor, which can be determined using existing imaging methods.

Other highly stromal cancers include ovarian cancer and triple negative breast cancer.

Continued over

Licensing of LOXL2 Assets

Pharmaxis is now in the process of seeking to transact its LOXL2 drug candidate assets, which have completed Phase I clinical trials.

The company is responding to remaining questions from potential suitors. Phillips said that having developed and used an assay to measure LOXL2 inhibition in its studies sets it apart from its competitors, such as Gilead Sciences.

The company's proprietary assay could be used in future to target the optimum population to treat (those who are likely to respond to treatment) as well as providing a way to measure treatment efficacy.

A transaction for the LOXL2 assets is anticipated around mid-year by the company. Another milestone is results from a Phase IIa study being conducted by Boehringer Ingelheim with a compound acquired from Pharmaxis from which Pharmaxis stands to receive further milestone and earnout payments.

That trial has just completed recruitment, with final analysis to start at the end of June and results in 2H 2019. If those results are in line with expectations, a Phase IIb trial is expected to follow.

Pharmaxis is capitalised at \$106 million with \$42 million in cash at the end of last year.

Bioshares recommendation: **Speculative Buy Class A**

Bioshares

How Bioshares Rates Stocks

For the purpose of valuation, Bioshares divides biotech stocks into two categories. The first group are stocks with existing positive cash flows or close to producing positive cash flows. The second group are stocks without near term positive cash flows, history of losses, or at early stages of commercialisation. In this second group, which are essentially speculative propositions, Bioshares grades them according to relative risk within that group, to better reflect the very large spread of risk within those stocks. For both groups, the rating “Take Some Profits” means that investors may re-weight their holding by selling between 25%-75% of a stock.

Group A

Stocks with existing positive cash flows or close to producing positive cash flows.

- Buy** CMP is 20% < Fair Value
- Accumulate** CMP is 10% < Fair Value
- Hold** Value = CMP
- Lighten** CMP is 10% > Fair Value
- Sell** CMP is 20% > Fair Value
(CMP–Current Market Price)

Group B

Stocks without near term positive cash flows, history of losses, or at early stages commercialisation.

Speculative Buy – Class A

These stocks will have more than one technology, product or investment in development, with perhaps those same technologies offering multiple opportunities. These features, coupled to the presence of alliances, partnerships and scientific advisory boards, indicate the stock is relative less risky than other biotech stocks.

Speculative Buy – Class B

These stocks may have more than one product or opportunity, and may even be close to market. However, they are likely to be lacking in several key areas. For example, their cash position is weak, or management or board may need strengthening.

Speculative Buy – Class C

These stocks generally have one product in development and lack many external validation features.

Speculative Hold – Class A or B or C

Sell

Corporate Subscribers: Cogstate, Bionomics, LBT Innovations, Opthea, ResApp Health, Pharmaxis, Dimerix, Adalta, Actinogen Medical, Patrys

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